

REMARKS

This is in response to the Office Action mailed December 8, 2009. Claims 1, 4-10, 12-16 and 18-34 are currently pending.

§ 103 Rejections

Claims 1, 4, 5, 7-10, 12-15, 27 and 29-34 are rejected under 35 U.S.C. 103(a) as being obvious over Ben-Haim et al. (US 6,309,370 B1) in view of Hadjicostis et al. (US 5,947,905) and in further view of Frey et al. (US 2005/0042424 A1). Claims 6, 16 and 18-26, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ben-Haim et al. in view of Hadjicostis et al. and Frey et al. as applied to claim 5 above and in further view of Webb (US 6,019,726). Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ben-Haim et al. in view of Hadjicostis et al. and Frey et al. as applied to claim 27 above and in further view of Proudian et al. (US 4,917,097).

Claim 1 recites a solid non-conductive material disposed over the sensor having a conductive coil and one or more traces formed over the sensor and disposed in the solid, non-conductive material. Claim 16 recites a sensor coil and a non-conductive layer of epoxy surrounding the sensor coil and first and second traces residing in the non-conductive layer of epoxy. Claim 27 recites a sensor and a non-conductive material surrounding the sensor and one or more conductive traces formed within the non-conductive material. The sensor of claims 1 and 27 and the sensor coil of claim 16 are configured to communicate with a medical positioning system.

The Office Action asserts that the coils 34 of Ben Haim correspond to the recited sensor or sensor coil (Office Action, p. 2-3). Ben Haim does not teach or suggest a non-conductive material or non-conductive layer of epoxy surrounding the sensor. Moreover, Ben Haim does not teach or suggest traces that formed within, or residing within or disposed within, this non-conductive material.

The Office Action turns to Hadjicostis and asserts that "Hadjicostis et al. discloses an embodiment comprising a non-conductive material disposed over the conductive primary layer or

core which comprises the circuit coils” (Office Action, p. 3-4). However, Hadjicostis does not teach such an arrangement. Hadjicostis does not appear to teach or suggest a “circuit coil” as asserted by the Office Action. The term “coil” does not appear in the text of Hadjicostis. The cited passage of Hadjicostis merely states that a primary matching layer 80a may be bonded to a piezoelectric element 90a, which may be then bonded to flex circuit 20 (Hadjicostis 8:10-37). The piezoelectric element 90a is part of an array of piezoelectric transducer elements that are analogous to the imaging device described in the present claims. The piezoelectric element 90a is not part of a sensor or sensor coil configured to communicate with a medical positioning system. Thus, Hadjicostis only discusses modifying the transducer elements and not a sensor.

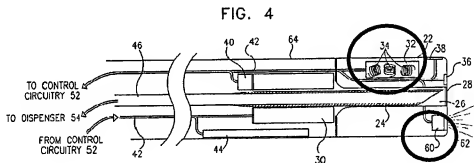
Likewise, Frey also discusses modifying matching layers that are used in ultrasonic transducer architectures (Frey, 1:5-8). Thus, both Frey and Hadjicostis are directed to the configurations of ultrasound transducers, not a sensor or sensor coil. Neither reference discusses the modification of a sensor or sensor coil. One of skill in the art would not turn to Hadjicostis or Frey to provide a modification of a sensor or sensor coil as asserted in the Office Action.

The Office Action maintains that “sensor or medical positioning sensor would encompass both imaging transducers and RF or magnetic/squid elements. While these sensors are *not ‘coils’ per-se*, the inclusion of traces or epoxy on a sensor element intended for an in-vivo environment is surely taught by Frey and Hadjicostis” (Office Action, p. 6, emphasis added). However, claims 1 and 16 recite a sensor comprising conductive coils and sensor coils. The cited references do not teach or suggest these elements.

M.P.E.P. § 2141.02(I-II) clearly states that the claimed invention must be considered as a whole and that “distilling an invention down to the ‘gist’ or ‘thrust’ of an invention disregards the requirement of analyzing the subject matter ‘as a whole.’” In the instant case, the Office Action suggests that because the transducers and the sensors are both intended for an in-vivo environment, a modification to a transducer teaches modification of the sensor. Thus, the Office Action distills

the invention, arguing that the gist is the inclusion of traces or epoxy on elements for use in-vivo, and ignores the structural limitations recited in the claims.

At best, Hadjicostis and Frey would inform one of skill in the art about how to prepare or modify the ultrasound transducer of Ben Haim. In Ben Haim, however, the ultrasound transducer 60 and coils 34 are separated from each other. Hadjicostis and Frey do not teach or suggest modification of a sensor or sensor coils and, therefore, one of skill in the art would not find it obvious to modify the coils of Ben Haim in view of Hadjicostis and Frey. Figure 4 of Ben Haim has been reproduced below as a courtesy to the Examiner with the transducer 60 and coils 34 circled for the purpose of illustration:



As can be appreciate from Figure 4 of Ben Haim, the ultrasound transducer 60 and the position sensor 32 are separate and distinct elements that are disposed apart from each other. Modifications to the transducer of Ben Haim in view of Hadjicostis or Frey would not provide a non-conductive material or non-conductive layer of epoxy around the coils of Ben Haim or produce traces in such a material or layer. There is no teaching or suggestion in Ben Haim that a modification to a transducer element can also be used as a modification to the sensor.

Thus, neither Hadjicostis, Frey, Ben Haim or any of the other cited references teach or suggest a non-conductive material or layer surrounding or disposed on a sensor or a sensor coil configured to communicate with a medical positioning system as recited in claims 1, 16 and 27. For at least these additional reasons, claims 1, 16, and 27, as well as the remainder of the claims which

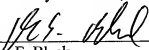
depend therefrom, are patentable over the cited references. Applicants respectfully request withdrawal of these rejections.

Claim 16 recites a drive shaft coil surrounding a coaxial cable, a sensor coil disposed distal to the drive shaft coil and an imaging device disposed distal to the sensor coil. The Office Action relies on Webb as teaching the drive shaft coil of claim 16 (Office Action, p. 5). First, the drive cable 16 is not a drive shaft coil surrounding a coaxial cable as recited in claim 16. Moreover, Webb fails to identify the arrangement of a drive shaft coil, a sensor coil disposed distal to the drive shaft coil and an imaging device disposed distal to the sensor coil. Instead, coil 28 is affixed to transducer 27 and rotates therewith (Webb 4: 52-54). Moreover, none of the cited references teach or suggest this specific spatial relationship between the imaging device, the sensor coil and the drive shaft coil recited in claim 16. For at least these additional reasons, claim 16, as well as claims 18-26 which depend therefrom, are patentable over the cited references. The Applicants respectfully request withdrawal of the rejections of these claims.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue. If the Examiner has any questions or concerns, the Applicants encourage the Examiner to contact the Applicants' representative, Bruce Black, by telephone to discuss the matter.

Dated: February 8, 2010

Respectfully submitted,

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